

NATIONAL INSTITUTES OF HEALTH
WARREN GRANT MAGNUSON CLINICAL CENTER
NURSING DEPARTMENT

SOP: Care of the Patient Requiring Noninvasive Intermittent Ventilatory Support (NIVS) and Tracheostomy Interface to Bilevel Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure (CPAP) on the Non-ICU Areas

Essential Information:

- A Self-Instructional Program" for care of the patient with a variety of types of NIVS is located in a binder that can be found in Nursing Education and on the 11 West patient unit.

I. Assessment

Prior to Initial Application of Ventilator Support Device

1. Review prescriber orders for NIVS
2. Airway for possible obstruction: i.e. edema of nasal passageway or pharynx, enlarged tongue, improperly fitting dentures, congenital abnormalities, and mucous plugging
3. Neurological status (example: Level of consciousness, orientation to person, place and time, ability to breathe and clear airway independently, choke and swallow reflexes, , and capability to express needs and communicate with staff)
4. Patient's/caregiver's understanding and cooperation about when and how to use NIVS
5. For any contraindications to NIVS (see reference 7, 1995 for self-instructional program) including:
 - a. severe upper airway obstruction
 - b. inability to spontaneously and independently clear copious secretions
 - c. worsening respiratory status evidenced by:
 1. need to increase the amount of delivered oxygen to maintain the pulse oximetry readings in the range ordered by the physician
 2. increasing CO₂ levels
 3. increased work of breathing
 4. increasing mucous plugging
6. Assess interface (ex: nasal, facial, oral, or full face masks) for proper size and fit

Prior to each Application of Ventilator Device

1. Assess patient's skin integrity and potential for sensitivity/reaction at sites of "patient/device interface" and intervene as appropriate Utilize protective equipment such as forehead spacers, head strap device, nasal pillows, and skin products (ex: duoderm) to relieve pressure on nasal bridge or other interface sites
2. Assess for previous history of complications (i.e. aspiration) and intervene as appropriate

During Application of Ventilator Device

1. Absence of significant air leaks (small air leaks are acceptable)
2. Integrity of connections
3. Patient comfort with wearing device (minimal strap tension to maintain an air seal)
4. Signs indicating need for added humidity (increased airway plugging, thick secretions, & epistaxis)
5. Auscultate (if possible) patient's breath sounds for adequate ventilation

During Use of Ventilator Support Device

1. Assess patient Q 1 hour for:
 - a. respiratory rate, depth, & effort
 - b. indications of respiratory insufficiency or distress (ex: restlessness)
 - c. pulse oximetry readings (required for pediatric patients)
2. Confirm rate, pressure(s), etc. are being provided as prescribed by the physician (see Appendix A)

After Equipment use

1. Assess patient for the number of hours of use and indications of inadequate therapy:
 - a. poor quality of sleep
 - b. nightmares
 - c. headache upon awakening
 - d. confusion
 - e. excessive daytime sleepiness
 - f. shortness of breath
2. Assess patient for complications of therapy:
 - a. gastric distention
 - b. skin irritation (nasal, chin, scalp, etc.)
 - c. nasal congestion
 - d. thick mucous secretions and /or plugs
 - e. epistaxis

II Intervention

Prior to Admission

Instruct patient/family/significant other to bring their NIVS equipment (ex: tubing, connectors, etc.) to the hospital

Prior to Initial Application of Ventilator Support Device

1. Place patient in room close to nurses' station as possible
2. If ventilator support equipment is brought from patient's home:
 - a. Assess electrical safety:
 1. Verify absence of obvious electrical safety problems
 2. Contact BEIP to conduct electrical safety check of equipment as needed.
 3. If device does not pass visual or BEIP inspection, do not use equipment and notify physician and Service Supervisor
 - b. Equipment/Alarms:
 1. Note presence or absence of alarms:
 - a. If alarms are present, confirm that they can be heard outside of patient's room
 - b. If alarms are absent, consult with physician and respiratory therapist
 - c. If patient is dependent on NIVS, alarms are required (example: continuous pulse oximetry).
3. For patients with improper sized interfaces, contact respiratory therapy or proper sizing of equipment (example: sizing gauges are available from Respiratory therapy to fit patients with proper mask size)
4. Education
 - a. Provide patient/caregiver with instruction as needed for NIVS device. Note location of instructional aids for patients
 - b. Ensure that patient is well hydrated prior to application of NIVS device to decrease risk of plugging and epistaxis

Prior to each Application of Ventilator Device

1. Verify suction and oxygen equipment is functional, age & size specific, and readily available in patient's room
2. Verify patient/caregiver can readily use nurse call system
3. Verify device settings (if visible) are as prescribed by physician and alarms (if present) are set appropriately.
Consult with Respiratory Therapy for any discrepancies

During Application of Ventilator Device

1. Assist patient as needed with application of device using a calm confident approach Have caregiver assist with children to decrease anxiety
2. Position patient comfortably.
3. Apply NIVS device and trouble shoot as needed for problems such as excessive leaks, discomfort, etc.(see reference 7: 1995 self-instructional program)

During Use of Ventilator Support Device

1. Respond immediately to alarms (if present) and intervene as appropriate

2. Assist with turning as needed
3. Notify physician and or respiratory therapist for equipment problems and complications

After Equipment use

1. Correct any identified patient problems (ex: for patient with nasal dryness and congestion, Respiratory Therapy will be contacted about adding increased humidification to the airflow) See reference: 7, "Complications of Noninvasive Ventilatory Support".
2. Verify appropriate device maintenance, cleaning, and changing of disposable parts by Respiratory Therapy (see reference 7, 1995 for self-instructional program)

Preparing Patient for discharge

1. Prepare patient for discharge as per Patient Teaching Plan: "Preparing your patient who requires NIVS for discharge" See reference #7
2. Remind patient to bring NIVS equipment for next hospitalization

III. Documentation

Document assessments and interventions including:

- a. Respiratory assessment including duration of therapy
- b. Hygiene and skin assessment
- c. Patient's response to therapy
- d. Functioning and maintenance of equipment as per standards
- e. Nursing interventions (ex: patients requiring repeated assistance with suctioning during NIVS and patient teaching)
- f. Equipment settings
- g. Complications

IV. References

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3. Curriculum Committee of the Association for Practitioners in Infection Control. (1988). The APIC curriculum for infection control practice. R.Berg (ed.) Vol. III. Kendall/Hunt: Dubuque, pp. 1286-1287.
4. American Respiratory Care Foundation, "Consensus Conference IV, Noninvasive Positive Pressure Ventilation", Respiratory Care, April 1997, Vol. 42, pages 364-369.
5. Fink, J., "Clinical Practice in Respiratory Care", Lippincott, 1999.
6. Hess, D., "Noninvasive Positive Pressure Ventilation: Predictors of Success and Failure for Adult Acute Care Applications", Respiratory Care, April 1997, Vol. 42, No. 4, pages 424-431.

7. Hill, N., "Complications of Noninvasive Positive Pressure Ventilation", Respiratory Care, April 1997, Vol. 42, No. 4, pages 432-442.
8. Knebel, "Noninvasive Intermittent Ventilatory Support Self-Instructional Program", January 1995. Located in the NIH Nursing Education Office on 7D37 and 11 West.
9. Knebel, A. et al, "A Guide to Noninvasive Intermittent Ventilatory Support" Heart and Lung, Vol. 26, No. 4, pages 307-316.
10. Pierson, D., "Noninvasive Positive Pressure Ventilation: History and Terminology", Respiratory Care, April 1997, Vol. 42, No. 4, pages 370-379.
11. Teague, G. "Pediatric Application of Noninvasive Ventilation" Respiratory Care, April 1997, Vol. 42, No. 4, pages 414-423.
12. Turner, R., "NPPV: Face versus Interface", Respiratory Care, April 1997, Vol. 42, No. 4, pages 389-393.

Appendices:



"Nursing Guidelines
for Patients Receiving

Appendix A: NIVS Nursing Guidelines

Approved:

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